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## IBM 7090/7094 IBSYS: 7320 CAPABILITY

This Technical Newsletter amends the publication IBM 7090/7094 IBSYS Operating System: System Monitor (IBSYS), Form C28-6248-1, to include directions for using IBM 7320 Drum Storage.

In addition to the prerequisite and related publications listed in the subject manual, the reader is assumed to be familiar with the contents of the publication IBM 7320 Drum Storage with 7090 and 7094 Systems, Form A22-6747.

Except in the specific cases listed below, the following substitutions should be made in the subject publication:

| Replace | With |
|---|---|
| disk | disk or drum |
| 1301 Disk Storage | 1301 Disk Storage or 7320 Drum Storage |
| xDam/s (disk) | xDam/s (disk) or xNam/s (drum) |
| 1301/7340 | 1301/7320/7340 |

This rule does not apply in the sections of the subject publication listed below. Unless a specific amendment appears in the remainder of this newsletter, these sections should remain unaltered.

| | |
|---|---|
| Page 16 | The paragraph under "Disk Storage Units" |
| Pages 26-27 | The entire section under "Disk Unit Control Block" |
| Page 46 | Example 3 |
| Page 48 | The second paragraph under "Introduction" |
| Page 51 | The first paragraph under "Adding 1301 Disk Storage and/or 7340 Hypertape Capability" |
| Page 56 | Figure 33 |

The following specific amendments and additions should be made in the subject publication:

| Page | Amendment |
|---|---|
| 16 | Insert the following after the section "Disk Storage Units": |

Drum Storage Units: A drum storage unit is designated as xNam/s, where x is the channel (A through H), N designates drum, a is the access arm (0), m is the module (0, 2, 4, 6, or 8), and s is the setting of the Data Channel Switch (0 for switch setting 1, 1 for switch setting 2).

| Page | Amendment |
|---|---|
| 27 | Insert the following immediately before the section "Hypertape Unit Control Block": |

Drum Unit Control Block

Each 7320 Drum Storage unit is represented in IOEX by a four-word unit control block, which is identical in format and usage to a Disk UCB except for the unit address in bits 5 through 17 of word 1.

The drum unit address has the format shown in Figure 11a.

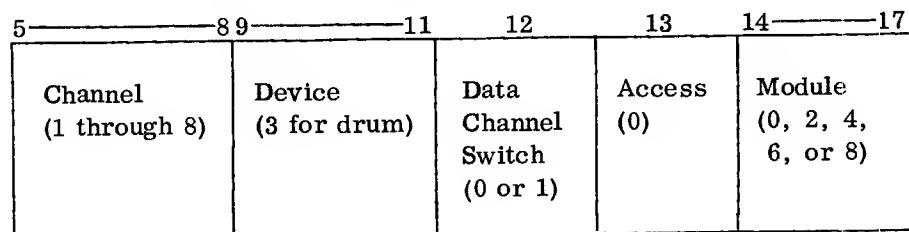| 5————————8 9————————11 | | 12 | 13 | 14————17 |
|---|---|---|---|---|
| Channel (1 through 8) | Device (3 for drum) | Data Channel Switch (0 or 1) | Access (0) | Module (0, 2, 4, 6, or 8) |

Figure 11a. Format of Drum Unit Address

Examples:

Channel C, Access, Module 0, Data Channel Switch Setting 0 is $(3300)_8$

Channel E, Access, Module 8, Data Channel Switch Setting 1 is $(5350)_8$

| Page | Amendment |
|---|---|
| 32 | The first sentence under "Recovery Action" should read: |

If the UNUSUAL END occurred during a read or write on a disk, (SEL+) is re-entered up to four times.

| Page | Amendment |
|------|-----------|

Insert the following as the second paragraph under "Recovery Action":

If the UNUSUAL END occurred during a read or write operation on a drum, (SEL+) is re-entered up to four times. If the UNUSUAL END persists, (SEL-) is entered with the appropriate bits set in the sense indicators to indicate the error condition.

**38**

Replace the second and third sentences of the first paragraph under "Function" with the following:

The System Monitor (IBSYS) must reside on SYSLB1. The remaining subsystems may also reside on SYSLB1 or may, if so desired, be split to reside on SYSLB2, SYSLB3, and/or SYSLB4. The four system Library Functions may be assigned to any combination of input/output devices (729 Magnetic Tape, 7340 Hypertape, 1301 Disk Storage, or 7320 Drum Storage). However, if a subsystem resides on disk or drum, the System Monitor (IBSYS) must also reside on disk or drum. Editing may proceed from any type of input/output unit (729, 7340, 1301, or 7320) to the same or any other type of unit.

**45**

Replace the second sentence of the paragraph beginning with "The System Editor writes..." with the following:

Disk writing is done in the 6-bit mode using a 465-word track format. A 524-word track format is used when writing on drum.

**47**

Insert the following two sections immediately before the section "System Library Preparation and Maintenance":

CREATION OF AN ALTERNATE LIBRARY

An alternate library (i.e., a library not containing the System Monitor (IBSYS) file and residing on SYSLB2, 3, or 4) can be created by using the extended *INSERT and *DUP cards described below:

| 1 | 7 | 16 |
|---|---|----|
| [TAPE] | *INSERT | [FILEMK] [, SYSALT] |

When the SYSALT option is specified, the action called for by the *INSERT card takes place on the unit assigned to SYSUT3 rather than SYSUT1.

| | 7 | 16 |
|---|---|----|
| | *DUP | SYSxxx, SYSALT, n |

When the SYSALT option is specified, the n files will be transferred from SYSxxx to SYSUT3 and the results on SYSUT3 will be edited in the same manner as they would have been if SYSUT1 had been used.

Example:

Assume that a system tape contains, among other things, a subsystem, SYSTMA, consisting of two files following IBSYS. Further assume that a new subsystem, SYSTMB, exists on SYSUT2 in column-binary card image form with one transfer card at the end. It is desired to create a new library on SYSLB1, without SYSTMA, and an alternate library (to be used as SYSLB3) consisting of SYSTMA followed by SYSTMB.

```
1        7        16
$JOB
$IBSYS
$IBEDT
         *EDIT    MAP,MODS
         *PLACE   SYSTMA                    Delete SYSTMA reference
                                              in SYSNAM
         *PLACE   SYSTMA,2,3,1              Make new entry with index 3
         *PLACE   SYSTMB,1,3               Insert a SYSTMB reference
         *AFTER   FILEMK                   Edit to SYSUT1 up to
                                              SYSTMA
         *DUP     SYSLB1, SYSALT,2         Put SYSTMA on SYSUT3
  TAPE   *INSERT SYSALT                    Follow with SYSTMB on
                                              SYSUT3
         *INSERT FILEMK, SYSALT            Put file mark on SYSUT3
         End-of-file                       Finish edit on SYSUT1
$IBSYS
```

Note: The Editor will finish the above edit by placing the *EOT record, which was written on SYSUT1, on SYSUT3 since the SYSALT option was specified at least once during the edit.


MAINTENANCE OF AN ALTERNATE LIBRARY

An alternate library (one without IBSYS) is modified by having it on SYSLB2 and using the SYSLB2 option on the *EDIT card. The edit will proceed in the normal fashion to SYSUT1. All Editor control cards except the *PLACE card and any cards on which SYSALT is specified are available for modification of the alternate library. However, care must be taken not to change the alternate library so much that it is no longer correctly reflected in the System Name Table of the SYSLB1 IBSYS file, since a new System Name Table cannot be generated with this edit. If SYSLB1 is on a disk or drum, a new System Loader Table reflecting the edit (such as new track origins of the systems on the alternate library if SYSUT1 is a disk or drum) will automatically be rewritten in the IBSYS file residing on SYSLB1.

| Page | Amendment |
|------|-----------|

Note that the discussion above concerns editing, for maintenance purposes, of an alternate library. If the SYSLB2 option is used on the *EDIT card and the library on SYSLB2 contains the IBSYS file, <u>all</u> Editor control cards are available. Editing proceeds from SYSLB2 to SYSUT1, and a new System Name Table, taken from the SYSLB1 IBSYS file and changed according to any *PLACE cards, will be written as part of the IBSYS file on SYSUT1. If SYSUT1 is a disk or drum, a System Loader Table will be generated by the Editor and written on SYSUT1. In contrast to the alternate library edit, the System Loader Table of the IBSYS file on SYSLB1, if it is a disk or drum, is not changed.

**48**

Insert the following as the third paragraph under "System Library Preparation and Maintenance":

The procedure for adding 7320 Drum Storage capability to an installation is similar to the procedure for adding disk and/or Hypertape capability except that the distributed preassembled system tape is not used with the update-edit deck. Instead the distributed symbolic tape which contains the IBJOB loader (IBLDR) is run with a symbolic modification deck, similar to the one shown in Figure 44, which modifies the loader portion of the IBJOB processor for drum storage. (This deck is available upon request from DP Program Information Department.) The system library tape produced by this run is then used in place of the preassembled tape (on unit A1) with the update-edit deck.

**50**

Replace Figure 29 with the following:

| 3 | 4 | 5 ——— 8 | 9 ——————— 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|
| Reserve Flag (0) | Channel Type (1 for 7909) | Channel (1-8) | Device (000 for Hypertape) (001 for Disk) (011 for Drum) | Data Channel Switch (0 or 1) | Access (0) | Unit or Module Numbers (0-9 for Hypertape or Disk) (0, 2, 4, 6, or 8 for Drum) |

Figure 29. Decrement of Entry for Hypertape, Disk, or Drum in Auxiliary System Unit Function Table

Replace the first sentence under "Changing the Assignment of 1301 Disk Storage" with the following:

An entry in the auxiliary System Unit Function Table for disk or drum storage is similar to an entry for Hypertape except that bits 14 through 17 specify a module number (0-9 for disk; 0, 2, 4, 6, or 8 for drum), rather than a unit number, and bits 9 through 11 are 001 for disk and 011 for drum, instead of 000.

| Page | Amendment |
|---|---|

Insert the following as the last paragraph under "Changing the Assignment of 1301 Disk Storage":

To permanently assign tracks 0040 through 0079 of drum storage module CN02/0 (channel C, Access 0, Module 2, Data Channel Switch Setting 1) as SYSUT3, the first of the two octal alteration cards above would be changed to

    15161        *OCT        023302000003

**51**    Insert the following after the second sentence under "Adding 1301 Disk Storage and/or 7340 Hypertape Capability":

The complete 7090/7094 Operating System can logically reside on drum storage. Although each of the subsystems under IBSYS has this capability, the complete system cannot physically reside on one 7320 Drum Storage unit.

**52-53**    The following changes should be made in the update-edit deck shown in Figure 31:

1. All cards that contain *BOTH in columns 67 through 71 should be changed so that they contain *ALL in columns 67 through 70.

2. The characters *DISK in columns 67 through 71 on the two cards following SECTION 4 should be replaced by *DKDM.

3. Card serial number IBD17640 should be IBD17690.

4. Card serial number EDO51440 should be EDO51220.

5. The UPDATE card preceding the card with serial number EDO51440 should appear as:

                  UPDATE    8,9

instead of        UPDATE    8,9,,D

6. Delete the three cards (ENDFIL, UNLOAD, ENDUP) following the card with serial number EDO51440.

7. Insert the following two cards immediately before the SECTION 4 heading:

                  ENDFIL    9
                  UNLOAD    9

8. Insert the following card immediately preceding the (END-OF-FILE Card) on Page 128:

              TAPE    *REPLACE    EDITOR

| Page | Amendment |
|---|---|

54     Delete the words "(as distributed)" in the first entry of the table showing the assignment and function of units for the update-edit deck.

Replace the third sentence of the second paragraph under "Preparing the 1301/7340 Update-Edit Deck" with the following:

Assembly parameters which are related to disk, drum, or Hypertape capability contain *DISK, *DRUM, or *HYPR, respectively, in columns 67 through 71. Parameters that are related to both disk and drum contain *DKDM in columns 67 through 71.

Replace the last sentence of the same paragraph with the following:

Most of these parameters are required for disk, drum, and Hypertape capability and therefore contain *ALL in columns 67 through 70.

55     The characters *BOTH in columns 67 through 71 of the TRAIL card in the section "Removal and Replacement of Cards in the Distributed Deck" should be replaced by *ALL in columns 67 through 70.

Replace the third and fourth sentence of the paragraph beginning "Immediately following SECTION 4..." with the following:

If 7340 capability only is to be added, the two cards containing *DKDM in columns 67 through 71 should be removed. If 1301, 7320, and 7340 capabilities are all to be added, none of the four cards should be removed from the deck.

56     The following changes should be made in Figure 33:

1.  Insert the following between the entries for DFA3 and DFAA1:

NFA1     EQU     x     The decimal number x specifies the number of 7320 Drum Storage modules (0 through 5) that exist on Data Channel Switch Setting 1 for channel A.

2.  The first sentence of the description of the DFAA1 parameter should be changed to:

The rightmost 10 bits of xxxx specify which of the disk or drum modules (specified in DFA1 and NFA1) on Data Channel Switch Setting 1 are attached, beginning with the leftmost of the 10 bits.

3.  The descriptions of the IFA1, DFAA2, and IFA2 parameters will be correct if the word "disk" is replaced by "disk or drum."

4. Insert the following between the entries for DFA4 and DFAA2:

NFA2    EQU    x    NFA2 is the same as NFA1 except that it applies to drum modules on Data Channel Switch Setting 2.

**57**

Replace the first sentence under "Changing the Assignment of 1301 Disk Storage" with the following:

An entry in the auxiliary System Unit Function Table for disk or drum storage is similar to an entry for Hypertape except that bits 14 through 17 specify a module number (0-9 for disk; 0, 2, 4, 6, or 8 for drum), rather than a unit number, and bits 9 through 11 are 001 for disk and 011 for drum, instead of 000 (see Figure 29).

Replace the second sentence of the paragraph under "Inserting IBJOB Monitor Assembly Parameters for Disk and Hypertape Capability" with the following:

If 1301 and/or 7320 capability is to be added, the card containing *DKDM in columns 67 through 71 should be punched and inserted in SECTION 2 of the 1301/7320/7340 update-edit deck.

**58**

Insert the following parameters in the proper places in Figure 35 according to their serialization numbers:

| | | | |
|------|-----|---|----------------|
| NFA1 | EQU | 0 | *DRUM IBB00950 |
| NFA2 | EQU | 0 | *DRUM IBB01060 |
| NFB1 | EQU | 0 | *DRUM IBB01520 |
| NFB2 | EQU | 0 | *DRUM IBB01630 |
| NFC1 | EQU | 0 | *DRUM IBB02090 |
| NFC2 | EQU | 0 | *DRUM IBB02200 |
| NFD1 | EQU | 0 | *DRUM IBB02660 |
| NFD2 | EQU | 0 | *DRUM IBB02770 |
| NFE1 | EQU | 0 | *DRUM IBB03230 |
| NFE2 | EQU | 0 | *DRUM IBB03340 |
| NFF1 | EQU | 0 | *DRUM IBB03800 |
| NFF2 | EQU | 0 | *DRUM IBB03910 |
| NFG1 | EQU | 0 | *DRUM IBB04370 |
| NFG2 | EQU | 0 | *DRUM IBB04440 |
| NFH1 | EQU | 0 | *DRUM IBB04940 |
| NFH2 | EQU | 0 | *DRUM IBB05050 |

The *DISK in columns 67 through 71 of the DFXA1, IFX1, DFXA2, and IFX2 parameters (where X designates the channel and varies from A through H) should be replaced by *DKDM.

| Page | Amendment |
|------|-----------|

**Page**  **Amendment**

60     The NOCH and NOHYP parameters in Figures 39, 40, and 41 should all have the following formats:

NOCH   EQU   0   NO. OF 1301 OR 7320 MODULES DEFINED IN IOCS *DKDM xxxxxxxx
NOHYP  EQU   0   NO. OF HYPERTAPE CHANNELS DEFINED IN IOCS *HYPR  xxxxxxxx

where xxxxxxxx is the serial number as it appears in the subject publication.

61     Replace the second sentence on page 61 with the following:

If 1301, 7320, and 7340 capability are all to be added, both cards should be prepared and inserted in SECTION 2 of the update-edit deck.

Item 2 under "Operating Procedure for the 1301/7340 Update-Edit Deck" should read:

If disk or Hypertape capability is being added, mount the distributed 729-capability System Library Tape on SYSLB1 (A1). If drum capability is being added, mount the System Library Tape which was obtained by running the symbolic tape with the symbolic modification deck (page 48) on SYSLB1.